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Preferred Topic Area: Advances in SAR Calibration

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CALIBRATION OF SIR-C DATA PRODUCTS

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The SIR-C/X-SAR imaging radar flew on the Space Shuttle Endeavour in April and October of 1994. This multi-frequency radar has fully polarimetric capability at L- and C-band, and a single polarization at X-band (X-SAR). Analysis of data collected during the two missions reveals that the SIR-C system was performing better than expected in terms of image quality and calibration. The cross-talk and phase stability of both systems has been exceptionally good, Calibration of polarimetric L- and C-band data for all the different modes SIR-C offers has been achieved by analysis of pre-flight test data to come up with a model of the system, analysis of in-flight test data to determine the actual antenna pattern and gains of the system during operation, and analysis of data from calibration sites distributed around the SIR-C/X-SAR orbit track.

The SIR-C mission is the first multi-frequency polarimetric imaging radar employing phased array antenna flown in space, The objectives of flying two missions in one year included the study of seasonal changes in the Earth's environment. In this paper, calibration results from both SIR-C/X-SAR missions will be presented. Particular attention will be paid to comparison of calibration results between the missions.

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